

# MANUAL OF METHODS IN FISHERIES BIOLOGY

*compiled by*

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**Fascicule 10**

Section 5. Field observations on fishing operations



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## SECTION 5. FIELD OBSERVATIONS ON FISHING OPERATIONS

### 5.0 INTRODUCTION

While a very large part of the data on which fishery biologists work consists of statistics of catch and of effort expended in taking it, the biologist's interest in fishing operations does not cease with the examination of such statistics. In the first place a fishery biologist must, with his technologist and economist colleagues, examine evidence on the nature of fishing effort, especially with regard to such characteristics as selectivity and efficiency. In the second place much can be learned about the behavior of fish from the direct study of relations between the fish and the fishing gear. Fishing gear and the methods of their use have been devised, especially in traditional fisheries, from considerable careful observation of fish behavior, and hence a report of an observation of a particular type of gear in use can of itself be exceedingly informative with regard to resources in the area of observation. In the third place a biologist may gather much information concerning the stocks he is studying by gathering together the observations of fishermen. For these and other reasons we include here some guides on the field work that may be done to gather such information.

### 5.1 IDENTIFICATION OF FISHING OPERATIONS, METHODS AND GEAR

A principal requirement of reports of observations on fishing is that there should be correct identification and description of the gear seen, and the methods by which they are used.

*Fishing operations.* This term signifies all operations in moving to and from fishing grounds, fish-searching and actual fishing. In reporting on operations in a particular locality a full account should be given of each phase of these operations, as follows.

1. Movement to and from fishing grounds: distance traveled, time of travel, whether trip is made by fishing vessel unaided or with mother-ship; nature of navigational method.
2. Fish-searching: whether aided by instruments and if so of what type; the signs looked for, such as water depth, type of bottom, current or other features of the sea, birds.
3. Fishing method: identify the method and describe any unfamiliar features of it. Methods fall into five principal classes:



- (a) *Collect*: picking up mollusks, sponges, etc. and dredging.
  - (b) *Kill and retain, simultaneously*: with weapons and hunting animals.
  - (c) *Kill and then collect*: using poisons, explosives, and electricity.
  - (d) *Attract, then kill and hold*: with baits and hook and line, and some set gear.
  - (e) *Capture, then kill*: with traps and nets.
4. Gear: the following classification, with the diagrams, will assist in identification of gear.

This classification signifies primarily the manner in which the gear itself operates against the fish, as operated or directed by the fishermen. The five main headings show the principal divisions in this sense of operational character whilst the various levels of subdivision indicate structural and operational features that serve this relation between fish and gear.

- 1. Gear for simple collection
  - 1.1 Baskets and other simple containers
  - 1.2 Dredges
  - 1.3 Dip nets
- 2. Gear used for simultaneous killing and retention
  - 2.1 Weapons thrust, thrown or projected with retention by hand or line
    - 2.11 Hand instruments
      - 2.111 Lances
      - 2.112 Spears
      - 2.113 Clamps
    - 2.12 Bow and arrow
    - 2.13 Harpoons
      - 2.131 Hand harpoons
      - 2.132 Rifle harpoons
      - 2.133 Gun harpoons
    - 2.14 Rip hooks (snag hooks)
    - 2.15 Gaffs
  - 2.2 Hunting animals
    - 2.21 Cormorants
    - 2.22 Sucker fish
    - 2.23 Otters
    - 2.24 Dogs
- 3. Gear (and material) used in killing fish which are afterward collected
  - 3.1 Striking weapons
  - 3.2 Poisons
    - 3.21 Released in water
    - 3.22 Blow pipes
  - 3.3 Electrical apparatus
  - 3.4 Explosives



- 3.41 Thrown explosives
- 3.42 Rifles
- 3.5 Weapons thrust, thrown or projected without retention (divide as for 2.1)
- 4. Gear used in killing and holding fish that have been attracted
  - 4.1 Lines and hooks
    - 4.11 Without hooks
    - 4.12 With hooks
      - 4.121 Gorge
      - 4.122 Curved hooks
        - 4.1221 Watched
          - 4.12211 Hand angling
            - 4.122111 Handline
            - 4.122112 Rod
            - 4.122113 Troll line
        - 4.1222 Unwatched
          - 4.12221 Floated line, drift longline
          - 4.12222 Anchored
            - 4.122221 Standing line
            - 4.122222 Longline, set longline
- 5. Gear used to capture fish which are then killed and retained
  - 5.1 Stationary gear (with no horizontal movement, fish being brought to the gear by their own movement in response to natural forces, e.g., currents, or to attraction, e.g., light, or reaction to some driving influence, e.g., sound)
    - 5.11 Passive stationary gear
      - 5.111 Traps
        - 5.1111 Barriers
          - 5.11111 Fish hedges
          - 5.11112 Box traps
        - 5.1112 Fish corral, fish weir
        - 5.1113 True traps
          - 5.11131 Gravity traps
          - 5.11132 Snares
            - 5.111321 Wire snares
            - 5.111322 Rope snares
            - 5.111323 Stock snares
        - 5.11133 Whippy bough trap
        - 5.11134 Torsion shutter trap
      - 5.1114 Baskets
        - 5.11141 Ground baskets
          - 5.111411 Fish pots
          - 5.111412 Wire baskets
          - 5.111413 Fyke net
            - 5.1114131 Braced bag
            - 5.1114132 Fyke net with rings



- 5.111414 Creels
- 5.111415 Trap net, pound traps
  - 5.1114151 Trap nets with rings
  - 5.1114152 Box nets
    - 5.11141521 Stake nets
    - 5.11141522 Fixed nets
- 5.11142 Buoyed trap
- 5.1115 Aerial traps, jumping fish traps
  - 5.11151 Verandah net
  - 5.11152 Raft trap
  - 5.11153 Boat trap
  - 5.11154 Box trap
- 5.112 Gill nets and tangle nets
  - 5.1121 Trammel nets
  - 5.1122 Gill nets
    - 5.11221 Set gill nets
    - 5.11222 Floating gill nets
    - 5.11223 Drift nets
  - 5.1123 Tangle nets
- 5.113 Active stationary gear, with vertical movement for capture
  - 5.1131 Lift nets
    - 5.11311 Hand lift nets
    - 5.11312 Stationed lift nets
    - 5.11313 Boat lift nets
    - 5.11314 Water wheels
- 5.2 Moving gear, with horizontal action
  - 5.21 Bag nets with fixed mouth
    - 5.211 Scoop, dip net
      - 5.2111 Skimming net
      - 5.2112 Push net
      - 5.2113 Dragged bag nets with fixed mouth
  - 5.212 Gape nets
    - 5.2121 Swing nets (stow nets) on stakes
    - 5.2122 Swing nets (stow nets) on anchors
    - 5.2123 Otter-board stow net
  - 5.22 Dragged gear
    - 5.221 Sweep nets
      - 5.2211 Single-walled
      - 5.2212 Triple-walled
    - 5.222 Trawl
      - 5.2221 Bottom trawl
        - 5.22211 Beam trawl
        - 5.22212 Otter trawl
        - 5.22213 Pareja
      - 5.2222 Floating trawl
        - 5.22221 Surface floating trawl
        - 5.22222 Midwater floating trawl



- 5.23 Seines
  - 5.231 Without bag
  - 5.232 With bag
    - 5.2321 Beach seine
    - 5.2322 Boat seine
- 5.24 Surrounding nets
  - 5.241 Barrier nets
  - 5.242 Spiral nets
  - 5.243 Ring nets, purse seine
- 5.25 Falling nets
  - 5.251 Lantern nets cover pots
  - 5.252 Cast nets
    - 5.2521 Hand cast nets
    - 5.2522 Cast nets from gallows or sheerlegs
    - 5.2523 Cast nets from boats

## 5.2 COLLECTION OF INFORMATION ON FISHING OPERATIONS

Fishermen are a source of circumstantial information that can prove of great value in some stages of research programs. Principally this information relates to the location and magnitude of resources, but often extends to behavior. Form 1 illustrates the kind of questionnaire that can be used as a checklist of questions which may be addressed to fishermen and, with its notes, indicates the manner of recording the replies given. Care must be taken, in framing questions, to avoid "leading" the person being questioned into giving an answer which he thinks the inquirer wants to hear or which he believes will serve the fishermen's own purposes.

Questionnaires of the kind illustrated in Form 1 should be used for unit fisheries and with regard to matters of which an informant can claim personal experience. Unit fisheries are usually designated by a name signifying the fishing grounds, or the species caught or the type of gear used, or the type of craft from which the fishing is conducted; sometimes a combination of these features is used. The main divisions for fishing grounds are as follows:

### *Inland*

- Cultivated stocks in ponds, etc.
- Wild stocks in rivers, lakes, reservoirs, etc.
- Estuarine fisheries

### *Marine*

- Onshore (beach fisheries, etc.)
- Near-shore or neritic
- Offshore
  - Pelagic
  - Midwater
  - Demersal



FORM 1. - QUESTIONNAIRE FOR INTERVIEWING FISHERMEN

1. THE INTERVIEW

- 1.1 Interviewer's name .....
- 1.2 Date of interview .....
- 1.3 Plans .....

2. INFORMANT

- 2.1 Informant's name .....
- 2.2 Address .....
- 2.3 Occupation..... skipper  
master fisherman  
member of crew  
other
- 2.4 Type of fishing in which informant engages .....
- 2.5 Fishing unit in which informant works .....

3. THE UNIT FISHERY ON WHICH INFORMANT FURNISHES INFORMATION

- 3.1 Name of fishery .....
- 3.2 Fishing grounds .....
- 3.21 Location .....
- 3.22 Distance from port or landing place .....
- 3.23 Nature of grounds .....
- 3.24 Sea conditions usually encountered on grounds  
at fishing time .....
- 3.3 Fishing operations
- 3.31 Season .....
- 3.32 Operating program .....
- 3.33 Amount of time sailing to grounds .....
- 3.34 Fish-searching methods .....
- 3.35 Fishing method .....
- 3.36 Fishing gear .....
- 3.37 Inboard handling of fish .....
- 3.4 The fish and the catch
- 3.41 Usual composition of catch.....
- 3.42 Seasonal variations in composition and size of catch.....
- 3.43 Behavior of the fish (migrations and schooling) .....
- 3.44 Spawning (season, place).....
- 3.45 Feeding .....

4. GENERAL OBSERVATIONS



## Notes on Form 1. Questionnaire for interviewing fishermen

Use one form for each unit fishery on which informant will give information; that is, when an informant can give information on two or more unit fisheries, use two or more forms.

2.4 Give the name of the type of fishing operations in which informant says he is engaged; if he is engaged seasonally in different fisheries, give both and if possible the proportions of time spent in each.

2.5 Give name of boat or other identification.

3.23 This applies primarily to bottom or foreshore; muddy, sandy, rocky, etc.

3.32 Give average duration of trips; times of departure; turn-around time.

3.34 If aids to fish detection are used report them: note also signs (birds, water color, etc.) looked for.

3.37 Report whether the fish are treated (gutted, etc.) on board and how they are stored.



2.11



2.13



3.3

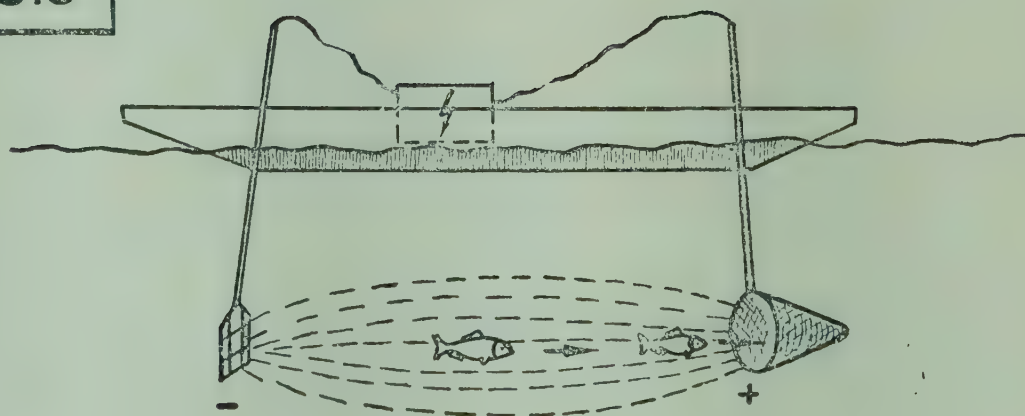
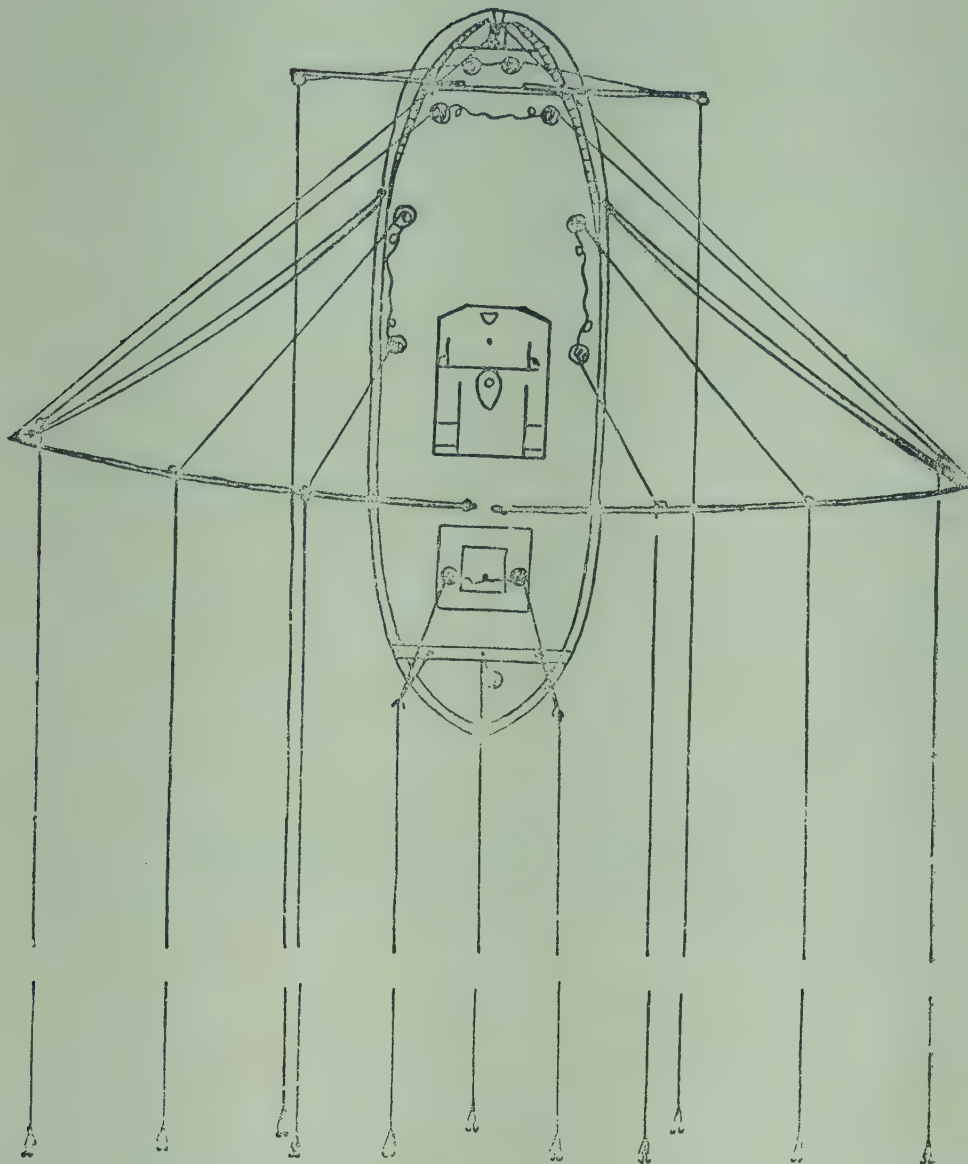


FIGURE 1. - Types of fishing gear  
(for explanation see classification)



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4.122222

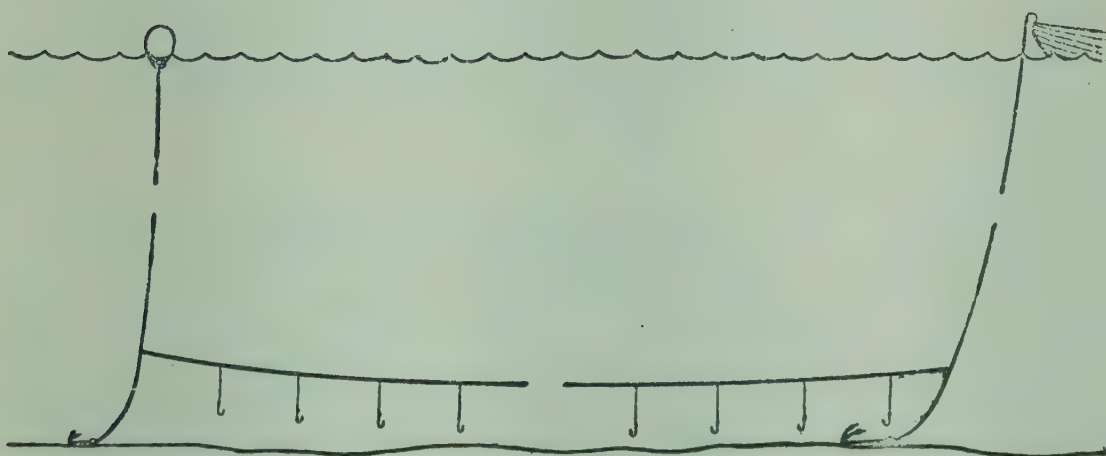


FIGURE 1 (cont.) - Types of fishing gear



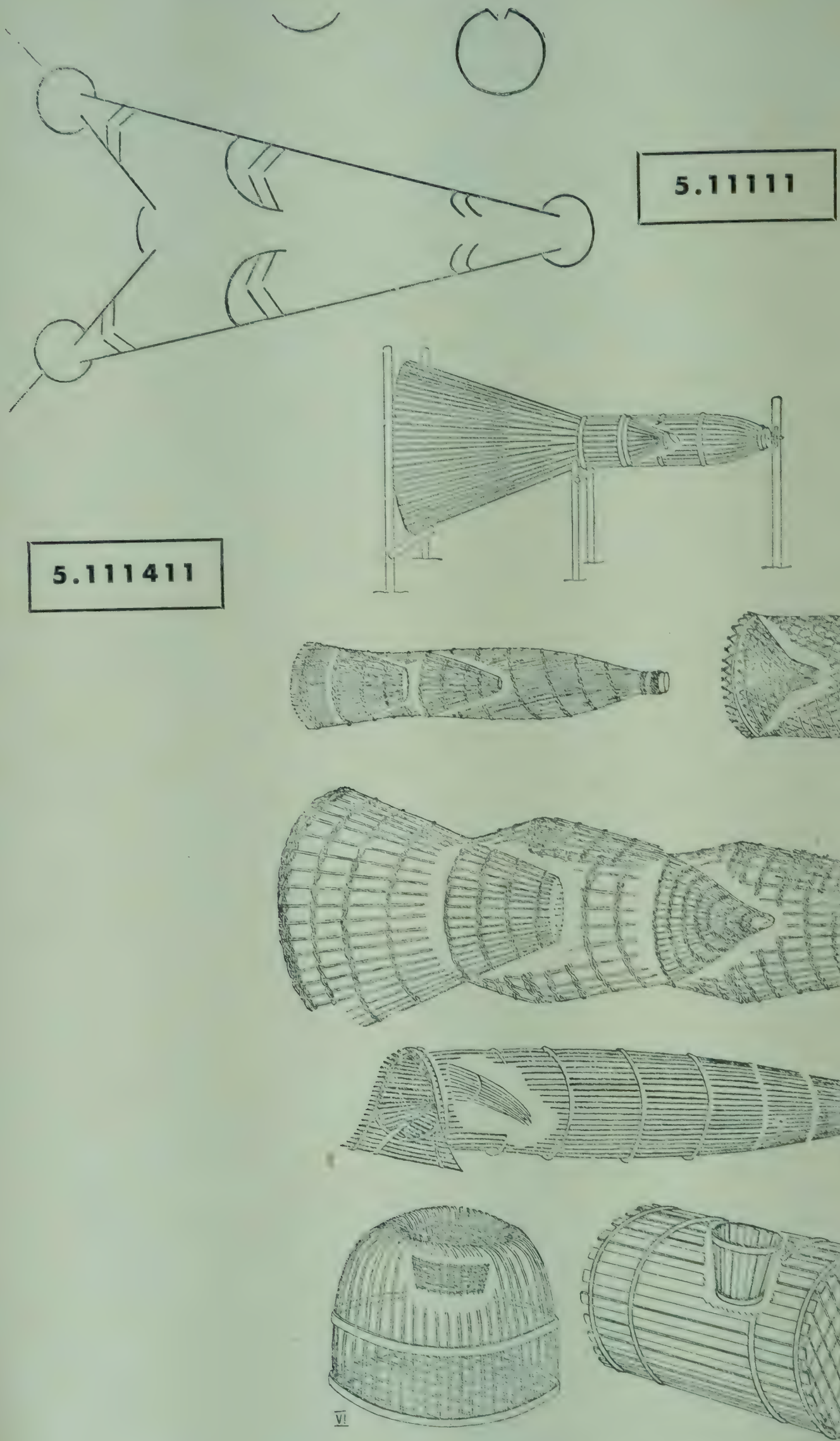
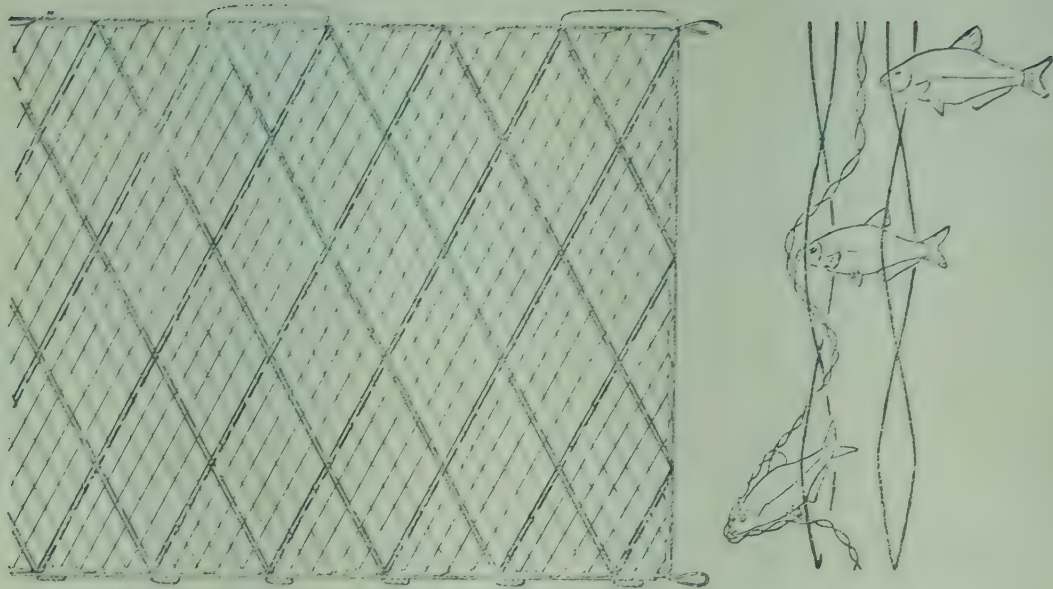


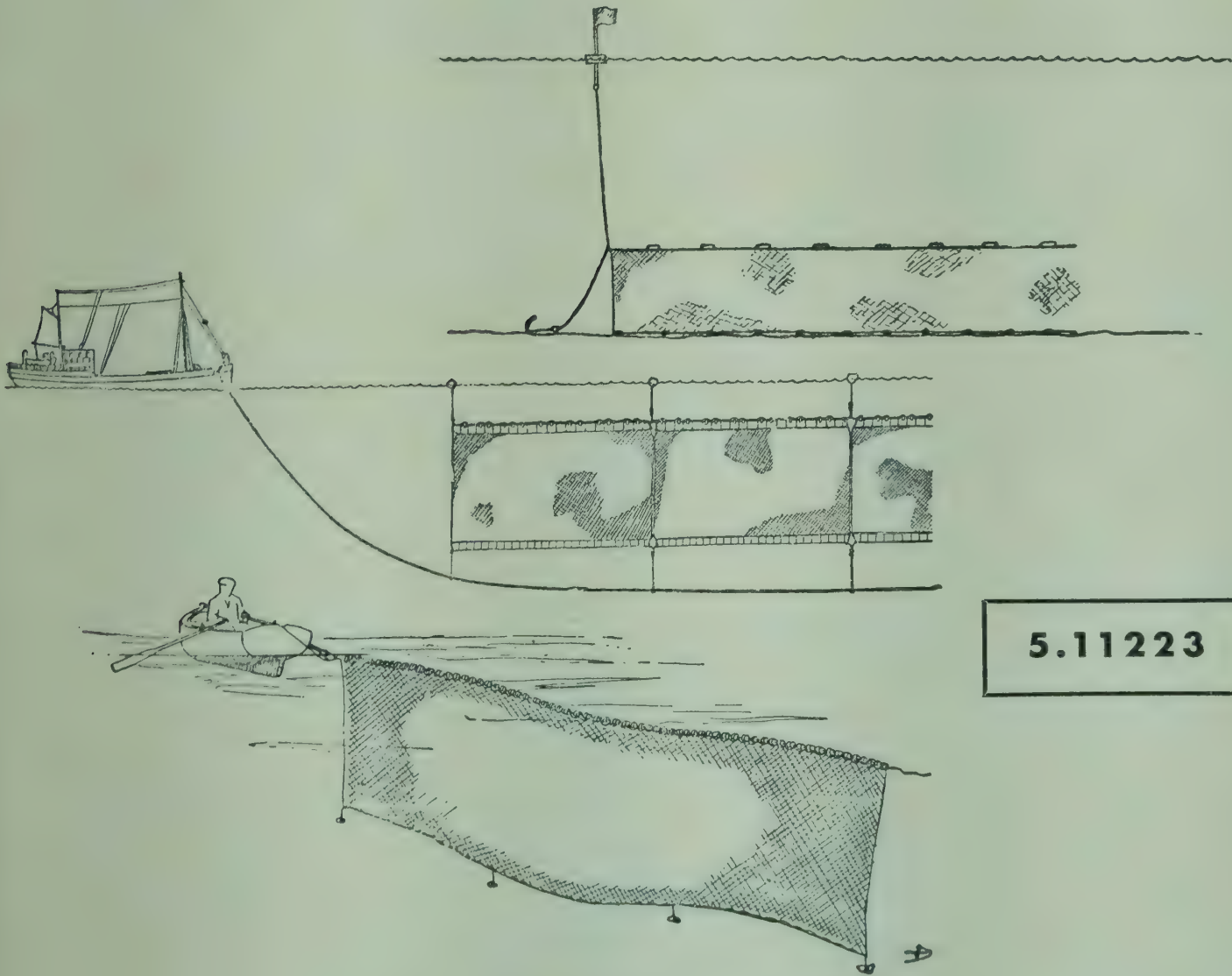
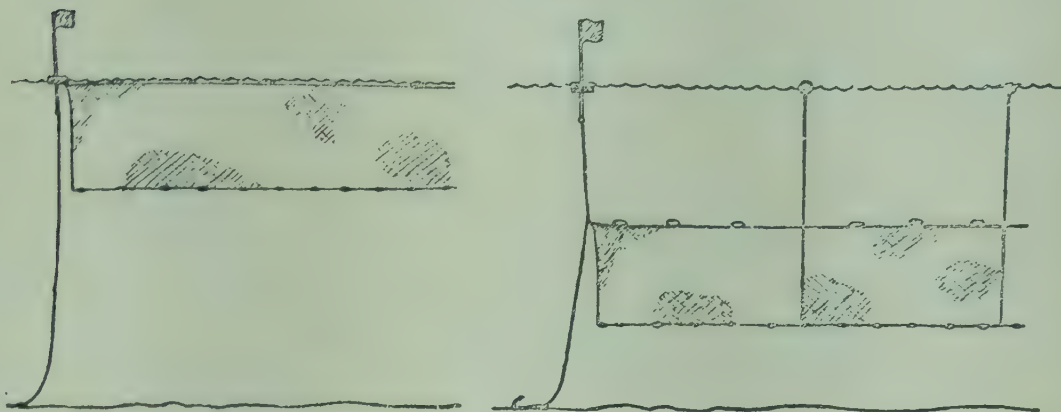
FIGURE 1 (cont.) - Types of fishing gear



5.1121



5.11221



5.11223

FIGURE 1 (cont.) - Types of fishing gear



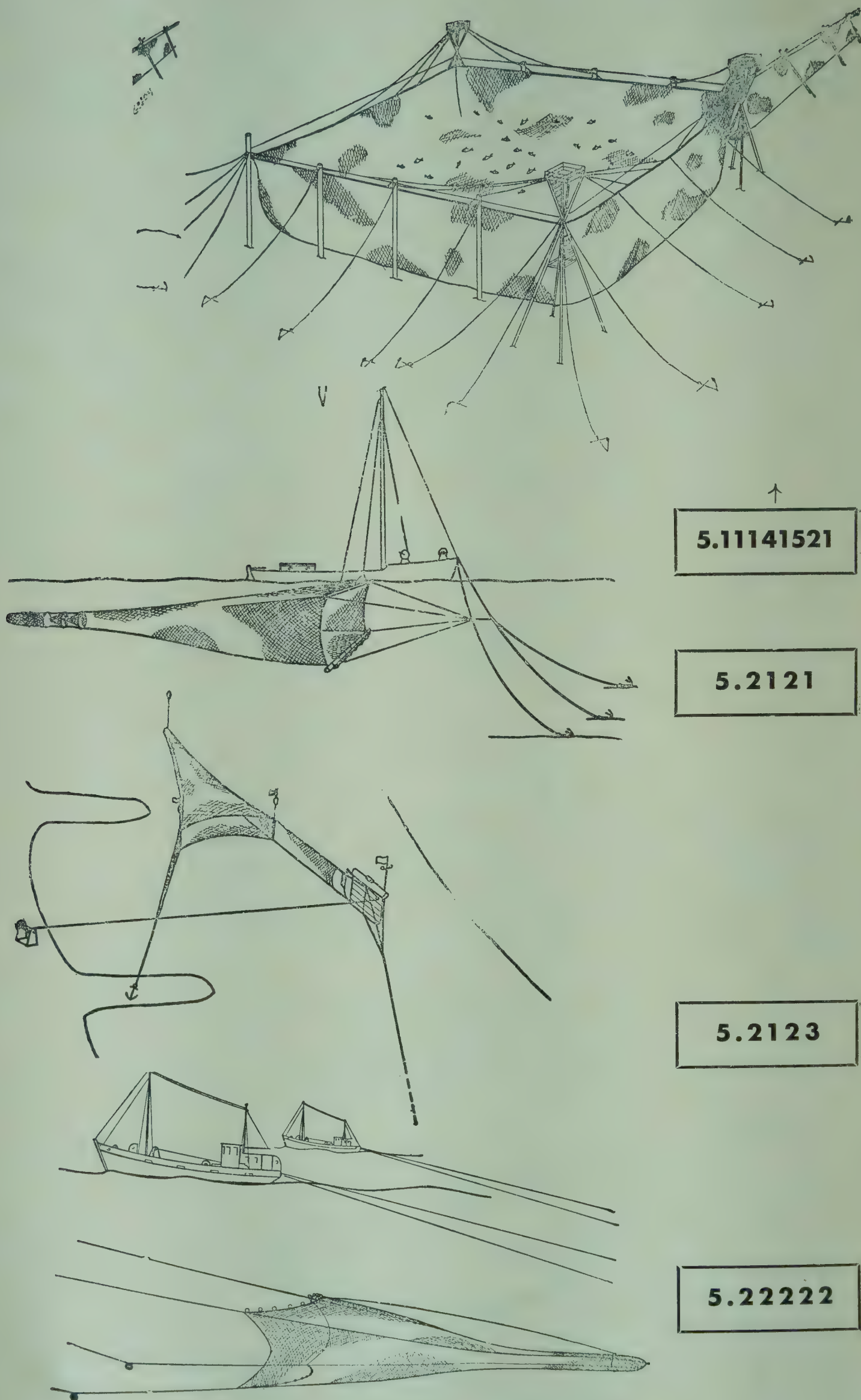
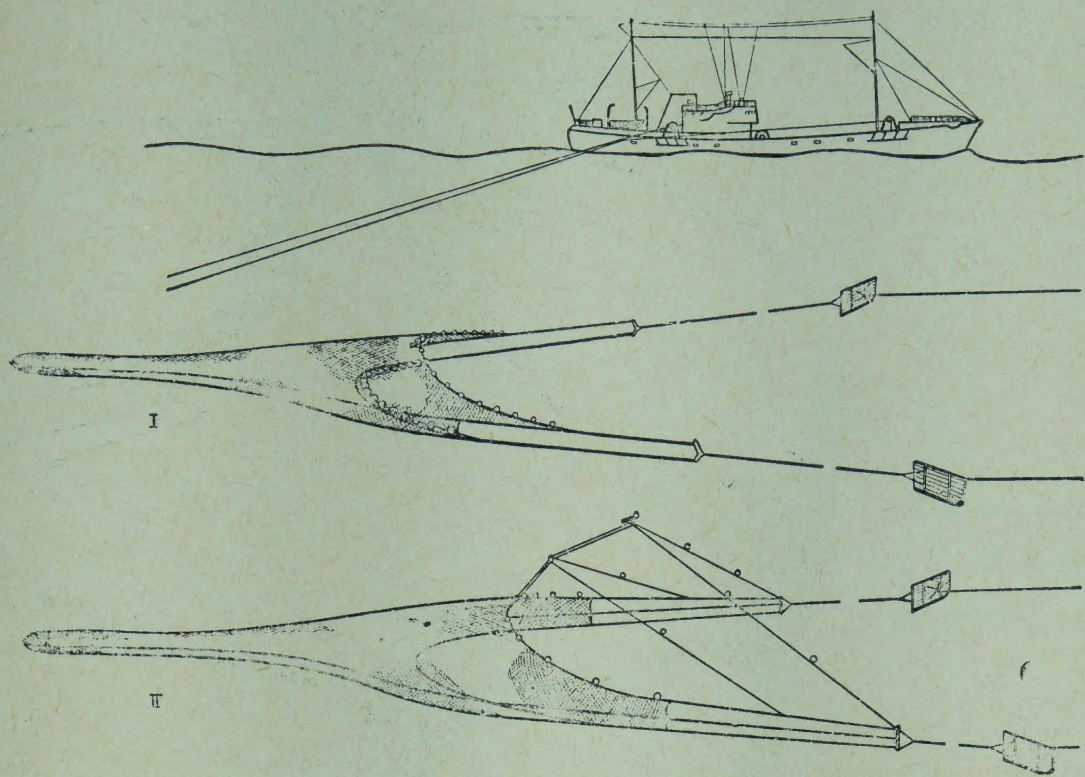


FIGURE 1 (cont.) - Types of fishing gear



5.22212



5.2322

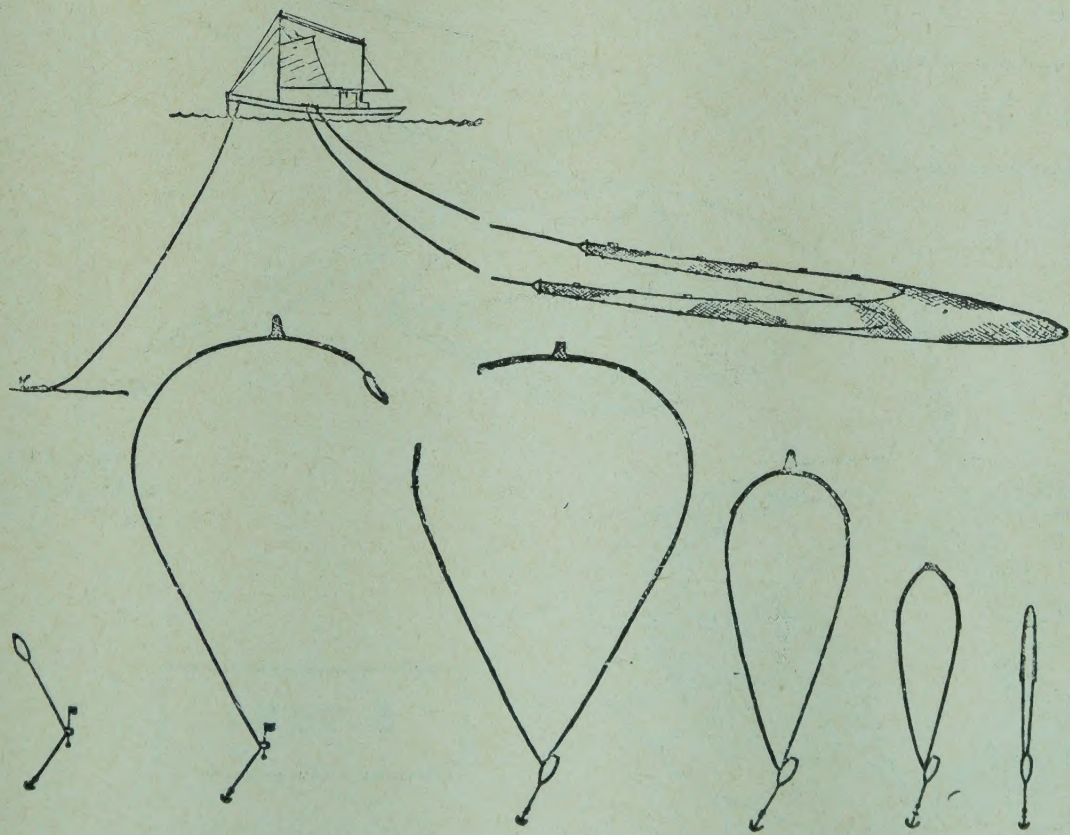
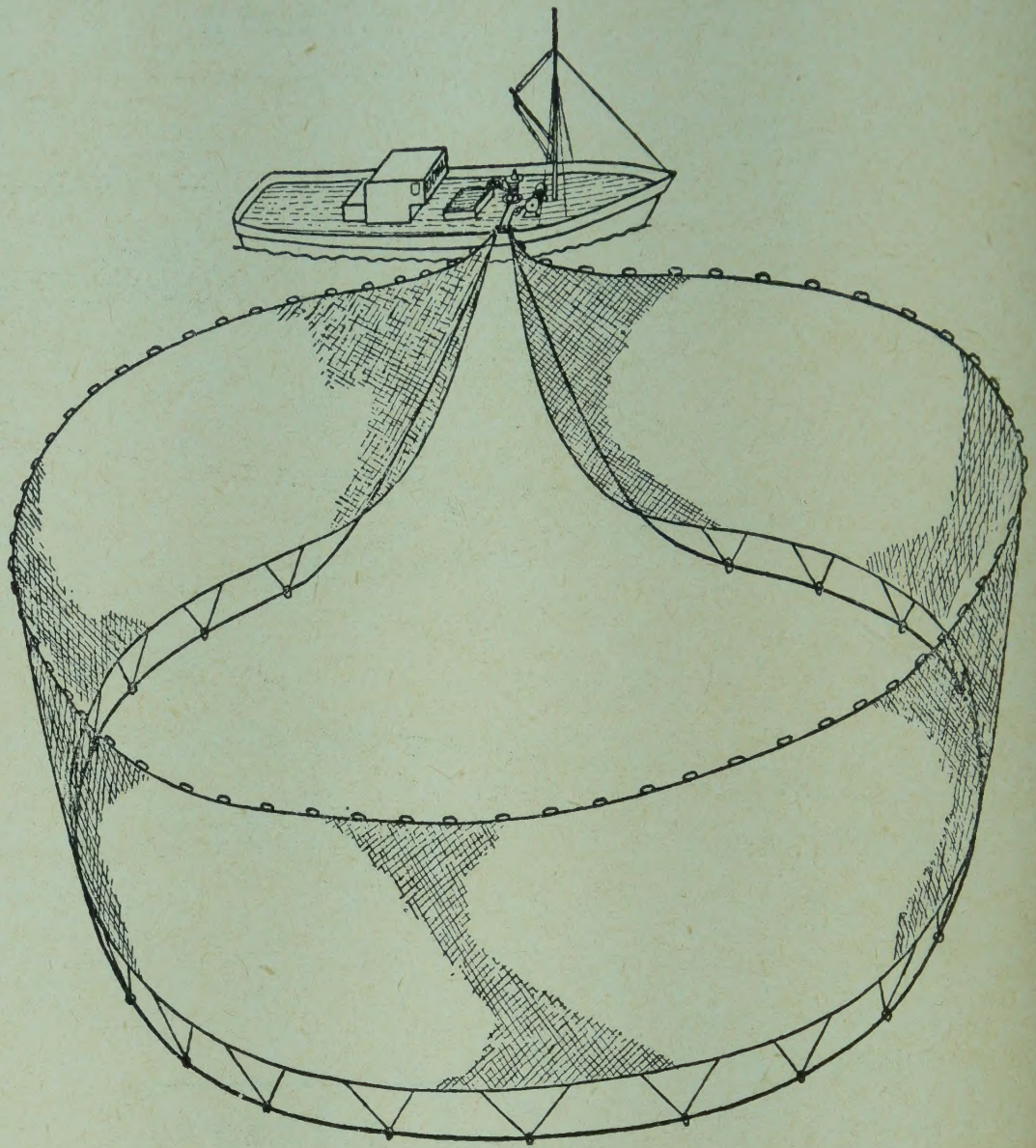


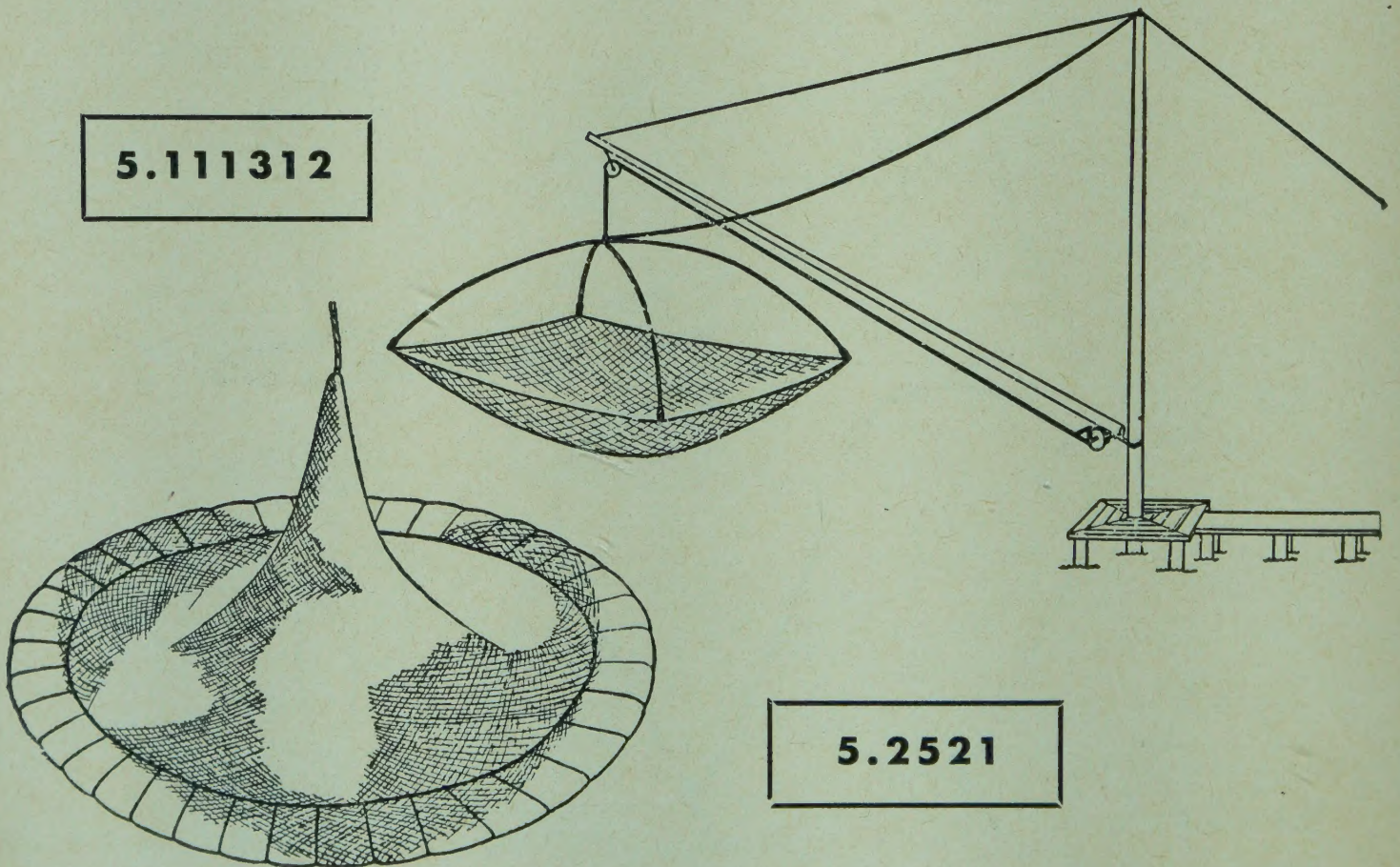
FIGURE 1 (cont.) - Types of fishing gear



5.243



5.111312



5.2521

FIGURE 1 (concl.) - Types of fishing gear







Price: \$0.50 or 2s 6d

15615/8.65/E/1/3800